

**TWO NEW SPECIES OF TRAP-NESTING ANTHIDIINI  
(HYMENOPTERA: MEGACHILIDAE) FROM SRI LANKA**

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*Abstract.*—Two new trap-nesting species of *Anthidiellum* (*Pycnanthidium*), *A. butarsis* and *A. krombeini*, are described from Sri Lanka. Comparisons are made with other known Oriental species of the subgenus.

*Key Words:* bees, Megachilidae, Anthidiini, *Anthidiellum*, Sri Lanka, trap-nest

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The known bee fauna of Sri Lanka suggests that the tribe Anthidiini (Megachilidae) is poorly represented. Only *Anthidiellum* (*Pycnanthidium*) *ramakrishnae* (Cockerell) (Pasteels 1972), *Pseudoanthidium* (*Exanthidium*) *rotundiventre* (Pasteels 1987), and the parasitic *Euaspis edentata* Baker (Pasteels 1980 as *E. carbonaria* Smith, Baker 1995) are recorded from Sri Lanka. Evidence that our knowledge of the anthidiines of Sri Lanka is far from complete is demonstrated by recent collections of megachilid nests by Karl Krombein and Beth Norden which yielded two new species of *Anthidiellum*. Here these new species are described to make the names available for descriptions of their nesting biology (Krombein and Norden 2001).

Terminology in the descriptions follows that of Michener (2000). The following abbreviations are used: T1, T2, . . . to represent the tergal segments of the apparent metasoma; S1, S2, . . . similarly for the sterna, and F1, F2, . . . for the flagellar segments of the antenna. The order of female and male descriptions is reversed between the two species because the holotypes are not of the same sex. Ordinarily species in the same subgenus would be described from the same sex to facilitate comparisons be-

tween the species. In this case the two species belong to different species groups, in one of which the females apparently bear the most diagnostic features, in the other, the males. Further, types for all described species of the former group are females. Thus the decision for holotypes of the opposite sex.

*Anthidiellum* (*Pycnanthidium*) *butarsis*  
**Griswold, new species**  
(Figs. 1, 3, 5)

Female.—Length, 6 mm; forewing length, 4.5 mm. Black except as follows: white marks on basal two-thirds of mandible, T-shaped mark on clypeus, paracocular stripe to level of midocellus, basal spot on fore- and midtibiae, ventral stripe on fore-femur, outer face of hind tibia except for discal black spot, outer faces of basitarsi; lemon yellow marks obliquely mesal to antennal socket, stripe on gena, spot on pronotal lobe, longitudinal stripe laterally on scutum, spot on axilla, medially interrupted posterior mark on scutellum, metapleural spot, tergal marks: lateral spot on T1 becoming broader and more nearly joined on succeeding terga to simple quadrate mark on T6; light red predominantly on femora, inner surfaces of tibiae. Wings hyaline. Pu-

bescence white. Scopa yellow. Punctuation of head, thorax dense except on anterior surface of mesopleuron; coarser on clypeus dorsally, supraclypeal area, lateral face of mesopleuron dorsally; very fine, contiguous on scutum, scutellum. Anterior face of T1 matt without punctuation; T1-5 with narrow impunctate apical margins approximately 1-2 punctures wide; T1 densely, nearly contiguously punctate; T2-5 less densely punctate especially basomedially; T6 contiguously punctate.

Mouthparts not exceeding fossa in repose. Mandible four-toothed, third tooth obscure. Clypeal margin with four denticles. Subantennal suture slightly arcuate. Pronotal lobe narrowly lamellate, anterior margin straight. Scutal-scutellar suture narrowly foveolate, not divided medially. Scutellum rounded posteriorly with shallow notch medially. Omaular carina complete, reaching ventral midline. Hind basitarsus one and one half times as long as broad (Fig. 3). Second hind tarsus broader than long. Preapical ridge of T6 slightly notched medially in dorsal view, in posterior view upturned medially. Scopal hair blunt apically.

Male.—Length, 5 mm; forewing length, 4 mm. Markings as in female except: entire lower half of face yellow except for small interantennal spot, T3-5 with complete yellow bands, margins translucent.

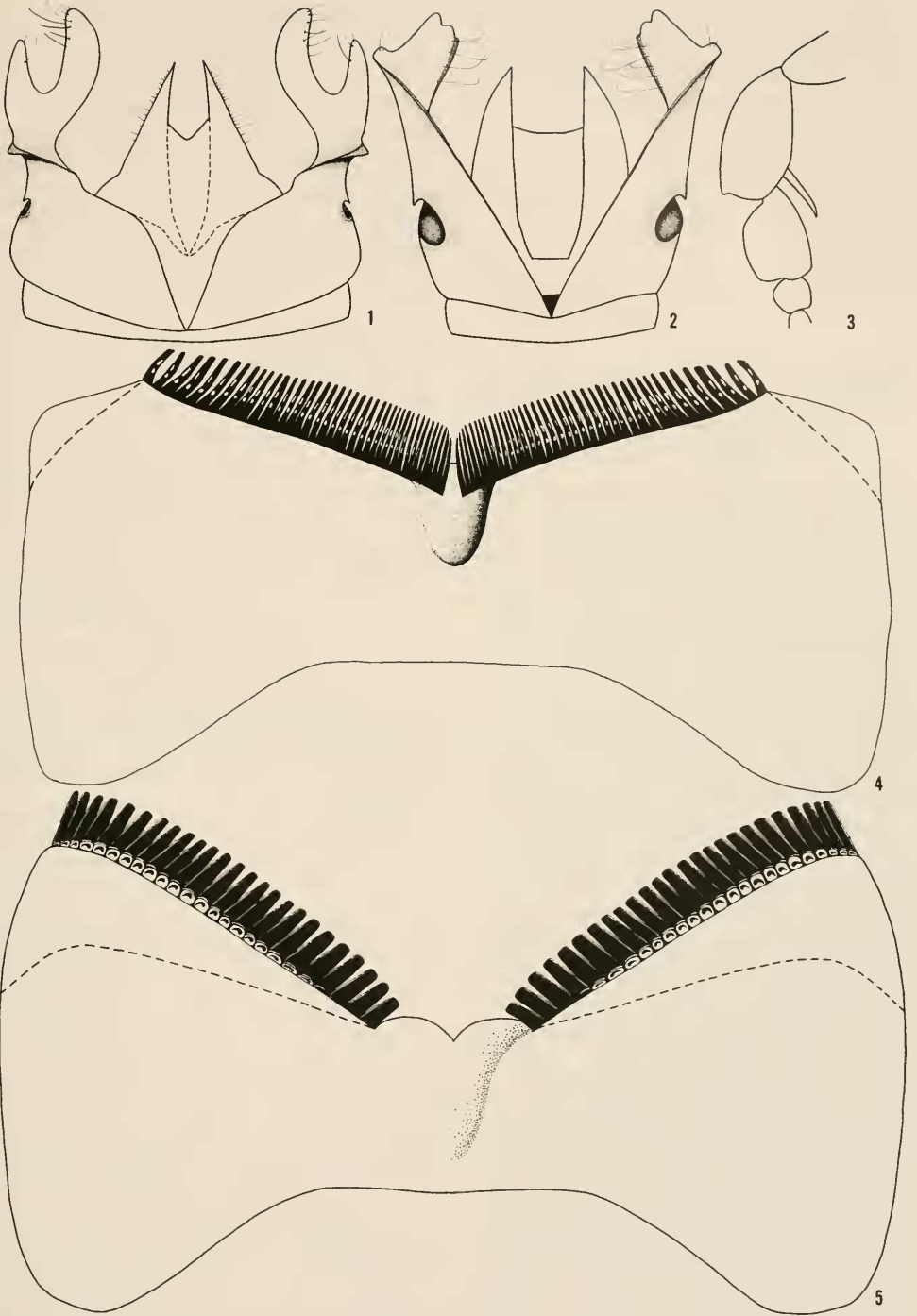
F1 as broad as long. F2-10 one and one half times as long as broad. Hind basitarsus twice as long as broad. Margin of T7 with median angle in ventral view. Margin of S4 with blunt submedian black spine. S5 with wide V-shaped posterior margin, margin with black comb well separated medially (Fig. 5). Genitalia as in Fig. 1.

Types.—Holotype ♀. SRI LANKA, Kandy District, Anniewatte, Kandy, 7°18'N 80°38'E, nest collected 5 Apr 1997, nest 18, K. V. Krombein, B. B. Norden, A. W. Norden, J. W. Norden. Reared paratypes: 2 ♀, same data as holotype; 1 ♀, same data except foundress. Non-reared paratypes, all same locality data and collectors: 1 ♀, 1-31 Mar 1997; 1 ♂, 1 ♀, 9-30 Apr 1997; 3

♀, 1-8 May 1997. Holotype in the National Museum of Natural History, Smithsonian Institution, Washington DC. Paratypes at Washington and Utah State University, Logan.

Discussion.—*Anthidiellum butarsis* belongs in a group of species that differ from other *A. (Pycnanthidium)* by the omaular carina reaching the ventral midline, the absence of a longitudinal carina on the hind tibia and basitarsus and by the enlarged hind basitarsus of the female. This group has in the past been accorded subgeneric status (*Pygnanthidiellum* Mavromoustakis) but was synonymized by Michener and Griswold (1994). They are well represented in Africa, but the only known Oriental Region representatives are *A. latipes* (Bingham), *A. ramakrishnae* (Cockerell), and *A. ratorium* (Smith). *Anthidiellum butarsis* can be distinguished from *A. latipes* and *A. ratorium* by the greatly enlarged hind basitarsus. It further differs from *A. ratorium* from southern India in the fine, contiguous scutal punctuation and the hindtarsal segment two of the female broader than long. None of the African species I have studied has the fine scutal punctuation either.

*Anthidiellum butarsis* appears close to *A. ramakrishnae* from southern India. An evaluation of its relationship is complicated by the condition of the type of *A. ramakrishnae*, the only known specimen of this species. The female holotype lacks the diagnostic hind legs, the metasoma is glued to the mesosoma so that the propodeum is not visible, and the central portion of the scutum is missing. Differences between *A. butarsis* and the type of *A. ramakrishnae* include anterior face of mesopleuron without impunctate area ventrally, lateral face of mesopleuron more coarsely and less densely punctate dorsally, posterior margin of scutellum more narrowly rounded with shallow but distinct emargination medially, T3 punctuation more coarse, punctures sparse basomedially, and apical carina of T6 shallowly incurved in dorsal view, in posterior view bent upward medially. The



Figs. 1-5. 1, 3, 5, *Anthidiellum butarsis*. 2, 4, *A. kronbeini*. 1, 2, Male Genitalia, dorsal view. 3, Female hind tibia and tarsus. 4, 5, Male SS.

markings on the face also differ. In *A. butarsis* there is an oblique mark along the inside of the antennal socket. Markings are variable in some anthidiines, but the other characters listed here are usually diagnostic. For this reason, and in the absence of quality comparative material of *A. ramakrishnae*, this species is here recognized as a new species.

Etymology.—From the Latin *bu*, large or huge, for the greatly enlarged hind basitarsus.

*Anthidiellum (Pycnanthidium) krombeini*  
**Griswold, new species**  
 (Figs. 2, 4)

Male.—Length, 4 mm; forewing length, 3.5 mm. Black except as follows: white marks on mandible except apically, ventral stripe on forefemur, hind tibia distally, basitarsi, narrow apical bands on T4-5, entirely on T7; lemon yellow on clypeus, paraocular area to level of antennal socket, most of subantennal area, elongate spot on gena near summit of eye, spot on pronotal lobe, transverse spot on anterior margin of scutum midway between lateral margin and midline, medially interrupted posterior mark on scutellum, longitudinal stripe on fore- and midtibiae, posterolateral spot on T1, transverse bands on T3-6, slightly interrupted on T3; amber on distal tarsi, terga laterally, sterna. Wings dusky; veins including stigma black. Pubescence white. Punctuation of head, dorsum of thorax coarse, contiguous except slightly separated medially on clypeus; finer on metanotum, metapleuron, lateral face of propodeum; punctuation of pronotum, tegula, anterior face of mesopleuron very fine, sparse on anterior face of mesopleuron; posterior face of propodeum below narrow pitted basal shelf impunctate. Anterior face of T1 polished without punctuation; T1-4 with very narrow impunctate margins less than puncture width; T1-2 densely, nearly contiguously punctate; T3-7 contiguously punctate; punctures of T1-2, T6-7 finer than on scutum.

Mandible tridentate. Scape three times as

long as broad. F1 broader than long. F2-10 slightly longer than broad. Mouthparts scarcely exceeding fossa in repose. Subantennal suture strongly arcuate. Pronotal lobe narrowly lamellate, anterior margin straight. Scutal-scutellar suture distinctly foveolate, divided medially. Scutellum rounded posteriorly with very shallow median notch. Omaular carina incomplete, not quite reaching ventral midline. Hindbasitarsus more than three times as long as broad. Margin of T7 without median angle in ventral view. S2 thickened preapically. Margin of S3 with fringe of long, medially curved hair. Margin of S4 without submedian black spine. S5 with shallow, evenly curved posterior emargination, margin with black comb scarcely divided medially (Fig. 4). Genitalia as in Fig. 2.

Female.—Length, 4.5 mm; forewing length, 4 mm. Markings as in male except: mandible, subantennal area, basitarsi, hindtibia dark; clypeal, paraocular marks white; frons with round lemon yellow spot; fore, mid tibial marks reduced or absent; white apical bands of T4-5 absent; mark on T6 quadrate.

Mandible tridentate, with long cutting edge and obscure dorsal tooth above two lower teeth. Clypeal margin with four obscure denticles. Hind basitarsus more than two times as long as broad. Second hind tarsus as long as broad. Preapical ridge of T6 not notched medially in dorsal view, in posterior view not upturned medially. Scopa off-white, hair blunt apically.

Types.—Holotype ♂. SRI LANKA, Kandy District, Anniewatte, Kandy, 7°18'N 80°38'E, 31 May – 3 Jun 1997; nest 5; K. V. Krombein, B. B. Norden, A. W. Norden, J. W. Norden. Reared paratypes: 1 ♂, 1 ♀ same data; 2 ♀, same except nest 21. Non-reared paratype, same locality data and collectors: 1 ♀, 1–31 Mar 1997. Holotype in the National Museum of Natural History, Smithsonian Institution, Washington DC. Paratypes at Washington and Utah State University, Logan.

Discussion.—*Anthidiellum krombeini* is

one of the smallest *A. (Pycnanthidium)*. It is similar in size to *A. smithii* (Ritsema) of Indonesia and Malaysia (Pasteels 1972) differing in the coarse punctation of the frons, scutum and terga and the shiny posterior face of the propodeum. In addition, the male of *A. krombeini* lacks a small central comb on S5 anterior to the apical comb, F1 is broader than long, and the hind tibia is more slender. In the female F1 is not longer than broad.

Etymology.—It is a great pleasure to name this species after Dr. Karl Krombein, who has invested so much of his life in the study of Sri Lankan Aculeata. It is additionally appropriate to name this trap-nesting species for Dr. Krombein, who has made a major contribution to our knowledge of aculeate nesting biology including the first comprehensive study of trap-nesting bees and wasps (Krombein 1967).

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